AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A vibration reduction control apparatus for an electric motor <u>to be driven in accordance with a rotational signal, the apparatus</u> comprising:

<u>a control means for generating the signal to achieve a target rotation of the electric motor;</u>

a detecting means for detecting a motor rotational number of the electric motor and outputting a motor rotational number signal based on the motor rotational number;

a band pass filter means for extracting a vibration signal of a predetermined frequency band from the motor rotational number signal; and

a feedback control means for ~~performing a correcting process for the vibration signal passing through the band pass filter means based on the motor rotational number~~ <u>correcting the target rotation of the electric motor based on the vibration signal;</u>

<u>wherein the control means generates the corrected rotation signal based on the corrected target rotation within the predetermined frequency band</u>.

2. (Currently Amended) A vibration reduction control apparatus for an electric motor <u>to be driven in accordance with a torque control signal, the apparatus</u> comprising:

<u>a control means for generating the signal to achieve a target torque of the electric motor;</u>

a detecting means for detecting a motor rotational number of the electric motor and outputting a motor rotational number signal based on the motor rotational number;

a band pass filter means for extracting a vibration signal of a predetermined frequency band including a frequency band of a disturbance vibration based on the motor rotational number signal ~~detected by the detecting means;~~

~~a correcting means for performing a predetermined correcting process which reduces a vibration of the vibration signal for the vibration signal of the predetermined frequency band extracted by the band pass filter means and obtaining a corrected amount; wherein~~

~~the control means performs an addition or a subtraction of the corrected amount obtained from the correcting means based on a feedback of the motor rotational number for the torque control signal of the electric motor~~; and

a feedback control means for correcting the target torque so as to reduces a vibration of the electric motor based on the vibration signal;

wherein the control means generates the corrected torque control signal based on the corrected target torque within the predetermined frequency band.

3. (Currently Amended) A vibration reduction control apparatus according to claim 1, wherein the ~~predetermined frequency band includes at least a resonance frequency band of the electric motor or an assembled body with the electric motor~~ corrected rotation signal is based on a current instruction value I and an angle instruction value θ to achieve the corrected rotation.

4. (Currently Amended) A vibration reduction control apparatus according to claim 1, wherein the ~~electric motor is mounted on a vehicle body as a driving source of a vehicle~~ the predetermined frequency band is in a range from 0.1 to 50 Hz.

5. (Currently Amended) A vibration reduction control apparatus according to claim ~~4~~ 3, wherein the predetermined frequency band ~~includes at least the resonance frequency band of a vehicle body with which the electric motor is assembled~~ is in a range from 0.1 to 50 Hz.

6. (Currently Amended) A vibration reduction control apparatus according to claim 2, wherein the ~~correcting process by the correcting means includes a PD control calculation~~ predetermined frequency band is in a range from 0.1 to 50 Hz.

7. (Original) A design method of a vibration reduction control for a electric motor, the method comprising:

an identification experiment step of performing an identification experiment for the electric motor;

a model parameter identification step of calculating coefficients of a frequency transfer function based on an input signal and an output signal for the electric motor;

a reference model establishing step of establishing a reference model;

a correction coefficient calculating step of calculating a proportional gain and a differential gain of a controller so as to correspond with the reference model by using a model matching method; and

a judging step of judging whether an apparatus including a controller fulfills a predetermined performance condition or not; wherein

when the apparatus does not fulfill the performance condition, the proportional gain and the differential gain are repeatedly calculated by the correction coefficient calculating step until the apparatus fulfills the performance condition.

8. (Original) A design method of a vibration reduction control for an electric motor according to claim 7, the method further comprising:

a discrete step of performing a discrete processing when the apparatus satisfies the performance condition judged by the judging step.

Claims 9 and 10. (Canceled).

11. (Original) A vibration reduction control for an electric motor, the control comprising:

an express means for expressing by a generalized plant on $H\infty$ control problem including characteristic fluctuation and sensibility characteristic of a control system for a transfer function of the controller;

a deal means for dealing a model error corresponding to the characteristic fluctuation and a virtual model error corresponding to a fluctuation of the sensibility characteristic as a structural fluctuation dependently; and

a derive means for adding a scaling matrix with scaling parameter corresponding to the each structural fluctuation to the generalized plant, and deriving the scaling matrix and the controller so as to minimize a H∞ norm of the generalized plant as a H∞ control problem with constant scaling matrix.

12. (Original) A design method of a vibration reduction control for an electric motor includes a controller for obtaining a corrected amount performing an addition or a subtraction for an instruction value on the torque control of the electric motor based on a motor rotational number, the method comprising:

setting a scale parameter d to a predetermined standard value; calculating the controller K(s) by γ-repeat method as H∞ control problem;

memorizing a H∞ norm of the generalized plant corresponding to a scaling parameter d at that time,

calculating the controller by gradually changing from the standard value for the scaling parameter d;

memorizing H∞ norm of the generalized plant corresponding to the scaling parameter d at that time,

calculating a local minimum value regarding H∞ norm of the generalized plant as a function f(d) for the scaling parameter d; establishing a scaling matrix D by a value of the scaling parameter d at that time;

calculating the controller K(s) by γ-repeat method using the value of the scaling parameter d giving local minimum value of function f(d);

and regarding the controller K(s) as an optimum solution, wherein

the optimum solution of the H∞ control problem with constant scaling matrix is calculated according to each of the processing steps.